A1 cont'd

off, so that the voltage of zero (0) at the ground line 6 is applied to the gate of the MOSFET 4 to turn off the MOSFET 4.

Please replace the paragraph beginning on page 3, line 6 as follows.

A2

Between the gate and the source and between the gate and the drain of the MOSFET 4, capacitors *Cgs* and *Cgd* are usually provided, respectively. These gate capacitors are illustrated by broken lines in FIG. 10. Decreasing turning-on and -off time periods of the MOSFET 4 to achieve a rapid switching operation thereof requires an increased ability of the drive circuit 1 to produce a great current for charging and discharging the gate capacitors of the MOSFET 4 when required to be switched between the on-state and the off-state.

Please replace the paragraph beginning on page 3, line 15 as follows.

A3

Accordingly, in the drive circuit 1, the base current of the transistor *T2* is set to a great value for enabling the transistor *T2* to withdraw as the collector current thereof the electric charge from the gate capacitors for a short time when the MOSFET 4 is switched from the on-state to the off-state. Additionally, the base current of the transistor *T1* is set to a great value for enabling the transistor *T1* to charge the gate capacitors of the MOSFET 4 for a short time with the collector current thereof when the MOSFET 4 is switched from the off-state to the on-state. The adjustment of these base currents is achieved by regulating the resistance values of the resistors *R4* and *R6*.

Please replace the paragraph beginning on page 3, line 26 as follows.

A4

The base current of the transistor *T2* inputted from the power supply line 5 through the resistor *R6* and the transistor *T4* continues to flow not only when the transistor *T2* is switched between the on- and off-states, but also during a steady-state operation in which the transistor *T2* is in the on-state (i.e., the MOSFET 4 is in the off-state). An increase in base current of the transistor *T2* for shortening the turning-off time period thereof, thus, causes the current consumption of the drive circuit 1 to increase, which results in an increase in quantity of heat generated by the resistors *R4* and *R6*. This requires a decrease in guarantee ambient temperature of the IC in which the drive circuit 1 is located.

Please replace the paragraph beginning on page 4, line 19 as follows.

A5

It is another object of the invention to provide a drive circuit whose current and power consumption is decreased without sacrificing the switching speed of a switching element to be controlled by the drive circuit.

Please replace the paragraph beginning on page 5, line 9 as follows.

A6

In the preferred mode of the invention, the high-side switching circuit includes an output transistor, a predriver driving the output transistor, a comparing circuit comparing the output voltage detected by the voltage detector with the on-decision voltage, and a logic circuit controlling an operation of the predriver based on a result of comparison in the comparing circuit.

Please replace the paragraph beginning on page 7, line 21 as follows.

A7

BRIEF DESCRIPTION OF THE DRAWINGS

Please replace the paragraph beginning on page 10, line 10 as follows.

The drive circuit 11 includes an output control circuit 18 for driving the transistor *T11*, an output control circuit 19 for driving the transistor *T12*, an *npn* transistor *T13* disposed between the input terminal 12 and an input terminal of each of the output control circuits 18 and 19, a constant current source *CS11*, and a voltage detector 20. The voltage detector 20 is disposed between the output terminal 13 and the ground line 17 and works to detect the voltage (i.e., the voltage signal *Vo*) appearing at the output terminal 13. The transistor *T11* and the output control circuit 18 function as a high-side switching circuit. The transistor *T12* and the output control circuit 19 function as a low-side switching circuit.

Please replace the paragraph beginning on page 11, line 3 as follows.

The drive circuit 11 also includes a high-side predriver 23 and a low-side predriver 24. The predriver 23 consists of a pnp transistor *T21*, npn transistors *T22* and *T23*, and resistors *R18* to *R20*. The predriver 24 consists of a pnp transistor *T24*, npn transistors *T25* and *T26*, and resistors *R21* to *R24*.

Please replace the paragraph beginning on page 11, line 8 as follows.

The output control circuit 18 shown in FIG. 2 includes the logic circuit 21 and the predriver 23. The output control circuit 19 shown in FIG. 2 includes the logic circuit 21, the comparator 22, and the predriver 24. Specifically, the logic circuit 21 is used both in the output control circuits 18 and 19.

Please replace the paragraph beginning on page 20, line 18 as follows.

The drive circuit 11 also includes the voltage detector 20 designed to detect the output voltage *Vo* (i.e., the gate voltage of the MOSFET 14) and the comparator 22 designed to compare the detected output voltage *Vo* with the off-decision voltage lower in level than the threshold value *Vth* of the MOSFET 14 and works to turn off the predriver 24 when the output voltage *Vo* is determined to be lower than the off-decision voltage to stop the supply of the base current to the transistor *T12*. Specifically, during a transitional period of time in which the MOSFET 14 is brought into the off-state, the transistor *T12* is turned on, thereby causing the MOSFET 14 to be turned off quickly. After the MOSFET 14 is turned off, the current flowing through the predriver 24 (including the base current of the transistor *T12*) is cut, thus resulting in a decrease in consumption of current and power in the drive circuit 11. As compared with the conventional drive circuit 1, the heat dissipation from the IC on which the drive circuit 11 is fabricated is decreased greatly without increasing the turning-on time as well as the turning-off time of the MOSFET 14. This allows the drive circuit 11 to be used in a high temperature environment and a large number of drive circuits equivalent to the drive circuit 11 to be built in an IC.

Please replace the paragraph beginning on page 21, line 12 as follows.

In the drive circuit 11, the longer the time in which the MOSFET 14 is in the off-state, the greater will be the current and power consumptions. The resistors *R25* and *R26* making up the voltage detector 20 work as pull-down resistors acting on the gate of the MOSFET 14. Therefore, even when the transistors *T11* and *T12* are turned off, the MOSFET 14 is kept off stably.

Please replace the paragraph beginning on page 25, line 21 as follows.

As apparent from the above discussion, the driver circuit 25 of the second embodiment has the voltage detector 30 designed to detect a potential difference between the power supply line 16 and the output terminal 13 (i.e., the output voltage *Vo* defined based on the potential at the power supply line 16) and the comparator 32 designed to compare the detected output voltage *Vo* with the off-decision voltage lower in level than the threshold value *Vth* of the MOSFET 26 and works to turn off the predriver 23 when the output voltage *Vo* is determined to be lower than the off-decision voltage to stop the supply of the base current to the transistor *T11*. Specifically, during a transitional period of time in which the MOSFET 26 is brought into the off-state, the transistor *T11* is turned on, thereby bringing the MOSFET 26 into the off-state quickly. After the MOSFET 26 is turned off, the current flowing through the predriver 23 (including the base current of the transistor *T11*) is cut, thus resulting in a decrease in consumption of current and power in the drive circuit 25. The longer the time in which the MOSFET 26 is in the off-state, the greater will be the current and power consumptions.

Please replace the paragraph beginning on page 26, line 23 as follows.

A14 The drive circuit 33 also includes the voltage detectors 20 and 30. In this embodiment, the voltage level determined by the right side of Eqs. (10) and (11) is the level of an on-decision voltage which lies within a voltage range in which the MOSFET 14 is turned on.

Please replace the paragraph beginning on page 27, line 2 as follows.

Therefore, when the control signal Sa is changed in level for turning on the MOSFET 14, the drive circuit 33 turns on the transistor *T11* on the high side. Alternatively, when the control

A14 cont'd

signal *Sa* is changed in level for turning off the MOSFET 14, the drive circuit 33 turns on the transistor *T12* on the low side. This charges or discharges the gate capacitors of the MOSFET 14 quickly.